

CLAIMS

What is being claimed is:

1. A device comprising:
 - a well;
 - a channel of first conductivity type formed in the well;
 - a high k layer overlying the channel;
 - a buffer layer overlying the high k layer;
 - a gate overlying the buffer layer;
 - a blocking layer overlying the gate; and
 - two source/drain regions of second conductivity type formed on opposite sides of the channel.
2. The device of Claim 1 wherein each of the high k layer, the buffer layer, and the blocking layer comprise epitaxial layers.
3. The device of Claim 1 wherein the gate comprises silicon germanium.
4. The device of Claim 1 wherein each of the buffer layer and the blocking layer comprise silicon.
5. The device of Claim 1 wherein each of the source/drain regions comprises silicon germanium.
6. The device of Claim 5 wherein each of the source/drain regions comprises amorphous silicon germanium.
7. The device of Claim 1 wherein the high k layer is selected from the group consisting of oxides of zircon, oxides of titanium, oxides of tantalum, and oxides of hafnium.
8. The device of Claim 1 wherein the blocking layer comprises less than or equal to ten layers of atomic silicon.

9. The device of Claim 1 wherein the buffer layer comprises less than or equal to ten layers of atomic silicon.

10. A device comprising:
a well;
a channel of first conductivity type formed in the well;
a high k layer overlying the channel;
a gate overlying the high k layer; and
two source/drain regions of second conductivity type formed on opposite sides of the channel, wherein the source/drain regions comprise silicon germanium.

11. The device of Claim 10 wherein the gate comprises a metal.

12. The device of Claim 10 wherein each of the source/drain regions has a depth of about 100 to about 1000 angstroms.

13. The device of Claim 10 wherein the source/drain regions comprise amorphous material.

14. A method of forming a device, the method comprising:
forming a well in a substrate;
doping a channel in the well with dopants of a first conductivity type;
growing a high k layer over the channel;
growing a buffer layer over the high k layer;
growing a gate over the buffer layer;
growing a blocking layer over the gate;
removing a portion of the high k layer, the buffer layer, the gate, the blocking layer;
removing a first portion of the well on a first side of the channel and a second portion of the well on a second side of the channel; and
forming two source/drain regions on either side of the channel.

15. The method of Claim 14 wherein growing a high k layer comprises epitaxially growing a metal oxide layer.

16. The method of Claim 14 wherein forming two source/drain regions comprises growing amorphous silicon germanium.

17. The method of Claim 14 wherein growing a buffer layer comprises growing epitaxial silicon.

18. The method of Claim 14 wherein growing a gate comprises growing silicon germanium.

19. The method of Claim 14 wherein growing a blocking layer comprises growing epitaxial silicon.